
Monitoring Certification and Review Process

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Focus

- ◆ Overview of the certification process
- ◆ Certification tests
- ◆ Required certification tests by system type
- ◆ Cert. application submittal & review roles
- ◆ Reviewing certification applications
- ◆ Post certification quality assurance (QA)

Prerequisites Certification Process

- ◆ The source must first submit a Certificate of Representation to CAMD establishing an Authorized Account Representative
- ◆ Submit an initial monitoring plan
- ◆ Submit notification of initial certification testing 45 days prior to starting certification testing

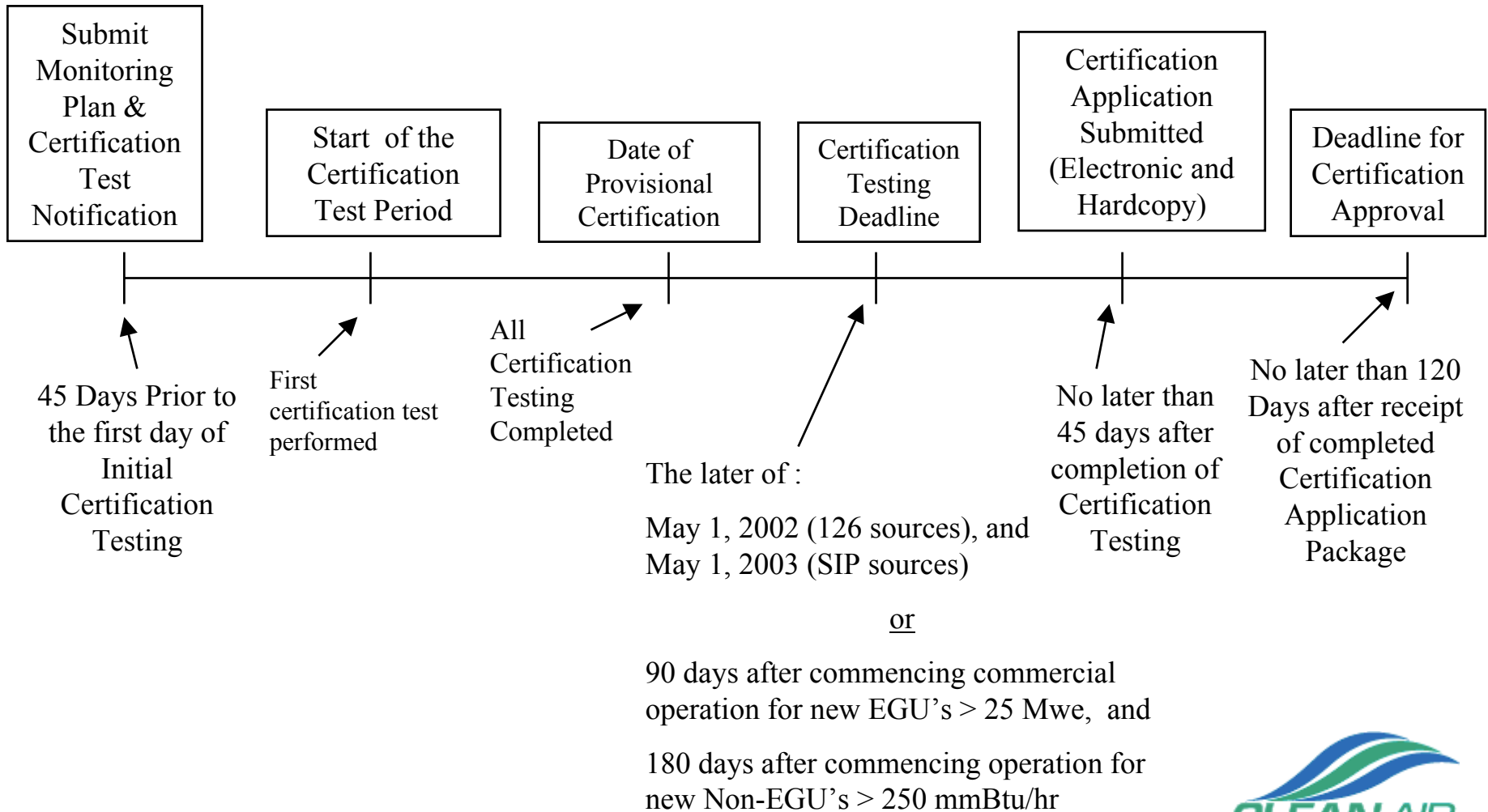
Overview of the Certification Process

- ◆ Begin certification test period
- ◆ Conduct all required testing for the system(s) to be certified
 - DAHS Verification
 - 7-day Calibration Error
 - Cycle Time
 - Linearity
 - RATA & Bias Test

Overview of the Certification Process (cont.)

- ◆ Upon successful completion of all certification tests, the system(s) are provisionally certified
- ◆ The completed certification application is submitted within 45 days after completing all initial certification tests
- ◆ The reviewing authority has 120 days after receipt of a complete certification application to review the application

Initial Certification Timeline



Performance Tests for Gas Monitoring Systems

- ◆ 7-day Calibration Error Test
- ◆ Linearity Check
- ◆ Cycle Time Tests
- ◆ Relative Accuracy Test Audit (RATA)
- ◆ Bias Test

7-Day Calibration Error Test

- ◆ Measure the calibration error of each pollutant monitor while the unit is combusting fuel once each day for 7 consecutive operating days
 - Zero Gas (0 - 20% of span)
 - High Gas (80 - 100% of span)

Linearity Check

- ◆ 3 point check of the linearity of each pollutant monitor while the unit is combusting fuel at conditions of typical stack temperature and pressure
 - Low (20 - 30% of span)
 - Mid (50 - 60% of span)
 - High (80 - 100% of span)
- ◆ NO_x spans [30 ppm are exempt

Cycle Time Test

- ◆ Determine the time it takes for 95% of the step change to occur going from:
 - a stable zero gas value to the stack emission value, and
 - a stable high calibration gas value to the stack emission value
- ◆ The cycle time is the slower of the two responses

Relative Accuracy Test Audit

- ◆ Compares the CEMS measurements to the appropriate EPA reference method
- ◆ Conduct a minimum of 9 valid runs
 - May discard up to 3 runs but must report all runs performed
- ◆ Select reference method traverse points in accordance with part 75, Appendix A § 6.5.6
- ◆ Recommended that RATA not be commenced until completion of other required certification tests

Bias Test

- ◆ Statistical test that evaluates the RATA data to determine if a low bias exists in the CEMS measurements, and determine the need for calculating a Bias Adjustment Factor (BAF)
- ◆ The CEMS passes the bias test if the mean difference is less than or equal to the absolute value of the confidence coefficient:

$$d \leq |cc| = \text{Pass Bias Test; no BAF}$$

Required Certification Tests for NOx Concentration Systems

- ◆ 7-day Calibration Error Test
- ◆ Linearity Check
- ◆ RATA
- ◆ Bias Test
- ◆ Cycle Time Test
- ◆ DAHS Verification

Performance Specifications for NO_x Concentration Systems (App. A, § 3)

- ◆ 7-day Calibration Error (CE)
 - $CE \leq 2.5\%$ of Span or within 5 ppm of the reference gas
- ◆ Linearity Check
 - $LE \leq 5.0\%$ of reference gas or within 5 ppm of the reference gas
 - NO_x analyzer is exempt if span ≤ 30 ppm
- ◆ Cycle Time Test
 - Perform upscale and downscale tests
 - System Cycle Time ≤ 15 minutes

Performance Specifications for NO_x Concentration Systems (App. A, § 3) (cont.)

◆ Relative Accuracy:

- RA calculated on a ‘ppm’ basis
- $RA \leq 10.0\%$ or within 15.0 ppm of the average reference value

◆ Bias Test:

- No system shall be biased low as determined by the test procedure in § 7.6 of Appendix A
- A Bias Adjustment Factor (BAF) is applied to NO_x concentration data whenever a low bias is detected

Required Certification Tests for NO_x-Diluent Systems

- ◆ 7-day Calibration Error Test performed on both the NO_x Concentration and Diluent components
- ◆ Linearity Check performed on both the NO_x Concentration and Diluent components
- ◆ RATA and Bias Test
- ◆ Cycle Time Test performed on both the NO_x Concentration and Diluent components; cycle time for the system is the highest of the components
- ◆ DAHS Verification

Performance Specifications for NO_x-Diluent Systems (App. A, § 3)

◆ 7-day Calibration Error (CE)

- NO_x: $CE \leq 2.5\%$ of Span or within 5 ppm of the reference gas
- CO₂ or O₂: $|R - A| \leq 0.5\%$ CO₂ or O₂

Performance Specifications for NO_x-Diluent Systems (App. A, § 3) (cont.)

◆ Linearity Check

- NO_x Linearity Error (LE): $LE \leq 5.0\%$ of reference gas or within 5 ppm of the reference gas
- CO₂ or O₂: $LE \leq 5.0\%$ of reference gas or within 0.5% CO₂ or O₂ of the reference gas
- NO_x analyzer is exempt if span ≤ 30 ppm

Performance Specs. for NO_x-Diluent Systems (App. A, § 3) (cont.)

◆ Cycle Time Test

- Test NO_x and diluent analyzers separately (upscale and downscale)
- Cycle time for NO_x-diluent system = slowest of the analyzers' cycle times
- System Cycle Time \leq 15 minutes

Performance Specs. for NO_x-Diluent Systems (App. A, § 3) (cont.)

◆ Relative Accuracy:

- RA calculated on a 'lb/mmBtu' basis
- $RA \leq 10.0\%$ or within 0.020 lb/mmBtu of the average reference value

◆ Bias Test:

- No system shall be biased low as determined by the test procedure in § 7.6 of Appendix A
- A Bias Adjustment Factor (BAF) is applied to NO_x emission rate data whenever a low bias is detected

Required Certification Tests for Stack Flow Systems

- ◆ 7-day Calibration Error Test
- ◆ RATA at three flue gas velocities
(except as provided by Part 75, App A, § 6.5.2)
- ◆ Bias Test at normal operating load
- ◆ DAHS Verification

Performance Specifications for Stack Flow Monitors (App. A, § 3)

- ◆ 7-day Calibration Error:
 - $CE \leq 3\%$ of Span or within 0.01 in H₂O of the reference value for differential pressure systems
- ◆ Relative Accuracy:
 - Test at 3 load levels for initial certification
 - $RA \leq 10.0\%$ or within 2.0 fps of reference value
- ◆ Bias:
 - No system shall be biased low as determined by the test procedure in § 7.6 of Appendix A
 - A Bias Adjustment Factor (BAF) is applied whenever a low bias is detected

Required Certification Tests for Moisture Monitoring Systems

◆ Wet / Dry O₂ Systems

- 7-day Calibration Error Test of each O₂ component
- Cycle Time Test of each O₂ component
- Linearity Check of each O₂ component
- RATA; reference method is EPA Method 4
- DAHS Verification

Required Certification Tests for Moisture Monitoring Systems

- ◆ Temperature sensor and moisture lookup tables
 - A three temperature demonstration that the correct moisture value is taken from the moisture lookup table and applied to the emissions data
 - DAHS Verification
- ◆ Other continuous Moisture Sensors
 - RATA; reference method is EPA Method 4
 - DAHS Verification

Performance Specifications for Moisture Monitoring Systems (App. A, § 3)

◆ Relative Accuracy:

- $RA \leq 10.0\%$ or within $1.5\% \text{H}_2\text{O}$ of the average reference value
- May not use the wet-bulb dry-bulb approximation method
- If saturation is expected, perform reference method 4 and measure the stack temperature. Compare saturation chart value to the reference method. Use the lower moisture value of the two methods.

Required Certification Tests for Appendix D Systems

- ◆ Fuel Flowmeter Accuracy Test, or
- ◆ Statement of calibration if the flowmeter can meet the accuracy standard by design
- ◆ DAHS Verification

Required Certification Tests for Appendix E Systems

- ◆ Fuel Flowmeter Accuracy Test, or
- ◆ Statement of calibration if the flowmeter can meet the accuracy standard by design
- ◆ Four load NO_x Emission Rate Performance Test using EPA Method 20
- ◆ DAHS Verification

Certification Application

- ◆ There are two parts to the Certification Application
 - Electronic Portion
 - Hardcopy Portion

Electronic Portion of the Certification Application

- ◆ A complete, up-to-date version of the electronic monitoring plan in accordance with § 75.53
- ◆ The results of required certification test(s) performed
- ◆ Report all applicable 100, 500, 600 and 900 level records in EDR v2.1 format

Hardcopy Portion of the Certification Application

- ◆ Any changed portions of the hardcopy monitoring plan since submittal of the initial monitoring plan
- ◆ Test reports containing all information required by § 75.59(a)(9) necessary to support the testing results
- ◆ Certification Application Form (EPA form 7610-14)
 - www.epa.gov/airmarkets/forms/arp/certapp.pdf
- ◆ Signature of the Authorized Account Representative

Certification Application Submittal

- ◆ Electronic Portions (100, 500, 600, 900 RTs)
 - Send Electronic Certification Test Data in EDR v2.1 format to CAMD
 - Submit electronically via e-mail:
MPCert-Reg#@epa.gov
 - » MPCert-Reg1@epa.gov
 - » MPCert-Reg2@epa.gov
 - » And so on . . .
 - Copy EPA Region and State with hardcopy submittal

Certification Application Submittal (cont.)

◆ Hardcopy Portions

- Submit to EPA Region and State
- Includes:
 - » Test strategy/protocol
 - » Detailed test report for each Reference Method performed for certification
 - » DAHS verification
 - » 7-Day calibration test data
 - » Linearity report with protocol gas certifications
 - » Cycle Time test results

Recertification Events §75.20(b)

- ◆ Recertification Events include:
 - Permanent replacements of analyzers and monitoring systems
 - Change of probe or probe location
 - Change in monitoring methodology
 - Replacement of critical orifice in dilution probes resulting in a change in the dilution ratio

Recertification vs Diagnostic Events

- ◆ CAMD is working on guidance to better clarify which events require recertification and which will only require some level of diagnostic testing

Recertification Test Timelines

§ 75.20(b)(3)(iv)

- ◆ Each required test is to be completed no later than the following number of unit operating hours after the probationary calibration.
 - Linearity Check; 168 unit operating hours
 - RATA; 720 unit operating hours
 - 7-day calibration tests; 21 consecutive unit operating days

Cert/Recert Application Review -- 126 Affected Sources

◆ CAMD

- Reviews the electronic submission using MDC
- Sends feedback to Source, State, and EPA Region

◆ State and/or Region

- Reviews hardcopy information with the electronic portion and CAMD feedback
- Communicates/resolves any deficiencies with Source

◆ Approval

- State makes recommendation to Region & CAMD
- CAMD makes final approval decision

Initial Cert Application Review -- SIP Affected Sources

◆ CAMD

- Reviews electronic submission using MDC
- Sends feedback to Source, State, and EPA Region

◆ State

- Reviews the hardcopy information with the electronic portion and CAMD feedback
- Communicates/resolves any deficiencies with Source

◆ Approval

- State makes the final approval decision
- State notifies EPA Region and CAMD



Recertification Application Review -- SIP Affected Sources

◆ State

- Reviews the electronic submission using MDC
- Reviews the hardcopy information with the electronic portion
- Communicates/resolves any deficiencies with Source

◆ Approval

- State makes the final approval decision
- State notifies EPA Region and CAMD

Certification Application Review

- ◆ AAR Signature and Certification Statement
- ◆ Electronic Portion Checks
- ◆ General Hardcopy Checks
- ◆ Certification Test Checks

Submission Basics

- ◆ Was the submission signed by the AAR?
- ◆ Is a certification statement included?
- ◆ Was the EPA Form 7610-14 submitted?
- ◆ Was the certification application submitted within 45 days of completing the certification tests?

Electronic Application Checks Submission and Feedback

- ◆ Was the electronic version of the certification application sent to CAMD?
- ◆ Was feedback received from CAMD?

Electronic Application Checks Monitoring Plan

- ◆ Is the monitoring plan representative of the installed CEMS?
- ◆ Have all stacks and emission points, including bypass stacks, been accounted for in the monitoring plan?
- ◆ Do the Unit ID's match those supplied by CAMD?

Electronic Application Checks Certification Test Summaries

- ◆ Is each of the required tests reported in the electronic certification application?
- ◆ Is there any MDC monitoring plan errors that have not been corrected?
- ◆ Is there any MDC QA evaluation errors that need correcting?
- ◆ Does the electronic certification application pass MDC review?

Hardcopy Application Checks

- ◆ Has a test report for each of the required tests been submitted?
- ◆ Was the test protocol and reference method procedures followed?
- ◆ Does the summary data in the hardcopy submission match the electronic report?

RATA Checks Moisture Basis

- ◆ Are the reference method and CEMS values reported on the same moisture basis?
- ◆ If moisture corrections were made, was an impinger method used to determine the moisture content of the flue?

RATA Checks NO_x Measurements

- ◆ Was a NO_x converter used when the reference method was performed?
- ◆ If NO_x span ≤ 30 ppm in a NO_x-diluent system, was the required linearity performed on the diluent monitor?

Calibration Gas Checks

- ◆ Did the tester use protocol gases to calibrate the reference method?
- ◆ Does the CEMS use protocol gases for daily calibrations and linearities?
- ◆ Does the CEMS use zero air material as defined in §72.2 for daily zero calibrations?

Hardcopy Certification Testing Review Summary

Indicate for each system if the required certification tests have been performed correctly and passed. (PASS, FAIL, N/A)				
SYSTEM ID	101			
System Parameter*	NOXC			
7-Day Cal Error Test	PASS			
Cycle Time Test	PASS			
Linearity Check	PASS			
RATA	PASS			
Bias Check	PASS			
Date that all tests for the system were completed?	2/20/02			
Recommend approval of the system for certification?	YES			

The End

Questions?